Chapter XIII

HABIT AND MEMORY

PLAYING on an instrument is just a habit. Perhaps it is better to say that it is the sum of many habits; hand-habits, eye-habits, ear-habits. The singer, too, forms habits—of lungs and voice-box, mouth and lips and tongue. It is important that all such habits should be right and good, so the teacher ought to know something about the origin of habit, and how to help the pupil to form good habits and avoid or undo bad ones.

454. In Chapter III we learnt that when a neural current passes through the brain it leaves a kind of 'path' behind; and that every time a path is travelled by a current it makes it easier for a similar current to travel that way. We learnt that, in reading music, when the eye sends in a message from the printed page through the in-carrying nerves, it passes through the grey matter of the brain and is switched on to some out-carrying nerves, which cause certain muscles to make the movements necessary to the playing of the passage. Each time this process is repeated it becomes easier, because at each repetition the path becomes deeper and the transit of the message more rapid (76).

455. *Repetition*, then, lies at the back of habit. When we perform any act for the first time—a new dancing step, for instance—we have to think about it and the movements of which it is made up. When we have repeated it many times it is

done without thought, at the mere suggestion of the music. This is because after a while the in-and-out message does not go to the upper brain, the thinking department, at all, but is switched off at one of the lower centres (76). The action then becomes automatic. The nervous system acts, as it were, without asking leave.

456. Unfortunately, repetition makes wrong-doing easy as well as right-doing. When a small boy, writing from school to his mother about his 'cello lessons, said, 'I find that if I once do a thing wrong I'm sure to do it wrong again,' he unconsciously illustrated the theory of the brain-paths and the law of habit; and his conclusion that 'the only safe thing would be *never once to do it wrong*' embraced a large part of life's philosophy.

457. Among the bad habits that hinder sight-playing is the habit of constantly looking down from the notes to find the corresponding places on the keyboard. This habit, no doubt, is contracted during the pupil's early struggles with notation, when he 'spells' the music, a note at a time, and looks down to find the place of each. It is a habit very difficult to cure, but it may be prevented, and the better habit of finding one's way about the keyboard without looking at it initiated instead.*

458. The 'spelling' habit also extends to the reading of time, and can be avoided altogether by the use of the time-names. As the *look and say* method of learning to read makes the word the unit and not the letter, so the time-names make

* See 'Guide,' page 11.

the pulse-group the unit and not the single note.

459. In teaching the movements necessary to the manipulation of an instrument, then, it is well to be on the watch for *tendencies* towards wrong habits, and not to allow them to reach the automatic stage; for habit is a tyrant, and does not easily part with his prisoners.

460. The 'new pupil' is, of course, the stock example of wrongdoing. But apart from the question of correctness, which might admit of argument, she has now to conform to a new teacher's ways of doing things, and this may entail the undoing of some fixed habits.

461. A bad habit is not cured by railing at it. It is better to aim at substituting the right habit and say little about the other. The right habit has to be started consciously, and established by repetition, and so we must have patience. And because opportunities for falling back into the old ways must be avoided, it is well to put aside the pieces in which the bad habits are wrapped up. But the pupil must not be allowed to think that the time she has spent on these has been wasted. Say to her, 'Do not touch those pieces *until I give you leave*. When I do give you leave you will play them more easily than you ever did.' She will find by and by that this is true, if she has brains. But meanwhile give her your *reasons* for your prohibition. The law of habit is very easy to understand; and a pupil is much more likely to take pains, both in forming and *un*-forming habits, if she knows that what she is obeying is not

a mere fad of her teacher, but a law of Nature, which acts in an inevitable way.

462. One of Professor James's maxims is: *Never suffer an exception to occur until the new habit is firmly rooted.* A lapse he compares to the letting fall of a ball of string which one is carefully winding up; a single slip undoes more than a great many turns will wind again. Any child can understand that; and the 'brain path' theory, simply told, will give the young pupil a notion of 'how the wheels go round,' and why certain processes lead to certain results. If some of the psychological and psycho-physiological facts on which learning depends were told to boys and girls in a simple way, and when suitable opportunity occurs, it would give them a notion of what their teachers are driving at, and secure some amount of intelligent co-operation in their own education.

463. Mental habits are formed in the same way as physical—by repetition. Repeat a mental process a sufficient number of times and you have a mental habit. Hence the importance of following the pupil's thought step by step. Why does the teacher of arithmetic work out a problem on the blackboard, questioning his class at each step as to 'what to do next'? Because he wishes to guide the mental process of the class and give an example of straight thinking. Why does he do this so often, daily perhaps? Because he wants to help them towards a *habit* of straight thinking. Why, when he gives home-work, is he insistent about seeing the working of a sum, and not content with the

right answer? Because he knows the importance of the process by which the answer has been found; and he can often suggest a reliable short-cut to the painstaking pupil who thought out the problem in a roundabout way. This, too, he does frequently, perhaps daily.

464. Too often the music teacher imagines that her 'explanation' is all that is necessary, and takes for granted that her pupil is thinking as she herself is thinking, while all the time something entirely different may be going on in the juvenile pate. The instinct that discerns when the pupil's thought is making a bee-line for the truth or just going to miss it is the instinct of the real teacher. Clear thinking under guidance in childhood and early youth will go far to establish a habit of clear thinking when the student is older and has to work independently.

465. The most practically useful chapter in William James's suggestive 'Talks to Teachers' is the chapter on Habit. Every youth, every girl should read it and respond to his appeal that they should 'make their nervous system their friend and not their enemy.'

466. Memory, like habit, has a physical basis (139-40). The two are closely connected. Memory, too, is conditioned by brain paths, but with a slight difference; for while habit cannot exist without repetition, a single strong impression may be retained and be liable to revival after the lapse of years (144). But impressions weak in themselves are strengthened by repetition, and are then easily recalled. So that if, as Professor James says,

'Habit makes us imitators and copiers of *our past selves*,' we might call habit a sort of memory and memory a sort of habit.

467. I have already alluded to memory in other parts of this book, and to avoid repetition I will refer the reader to those portions when necessary. At this point, some parts of Chapter V might be re-read. Paragraphs 139 to 144, the 'impression'; paragraphs 186 to 188, the 'recall.'

468. Memory is partly a physiological and partly a psychological phenomenon. An impression is made in the cortex, and there it remains for a shorter or a longer time, its permanence being in proportion to its strength or the frequency of its recurrence. The retention is purely physical; in fact, Titchener says it is a mistake to say that the *mind* retains, for it is not the mind, but the cortex, which is retentive.

469. But retention is not memory, it is only one of its conditions; it makes memory possible, that is all. An impression on your cortex might slumber there for ever if something did not happen to awaken it; it might as well not be. So we must next consider the condition of recall.

470. In recall we pass from the physical to the psychical. The impression was made by a past experience which left a brain path. The accidental occurrence of a similar experience, or of some associated experience, throws that part of the cortex and its associated brain paths into a commotion which resuscitates the slumbering impression, and with it whatever associated impressions there may be. The whole comes rushing

into consciousness, the physical phenomenon becomes a psychical one, and we *remember*, i.e. we recognize that the group of ideas now in consciousness has been there before. This feeling of familiarity is what completes the process of remembering.

471. We have learnt that if an idea is to be assimilated by the mind we must tack it on to some ideas already there (382); and that gradually groups of associated ideas are formed, which we called Apperception Masses (285). Now, if we want to 'remember' any fact, any of its associated ideas will serve as a reminder, a cue, 'a hook to which it hangs, a means to fish it up when sunk beneath the surface.' We know, too, that an idea may belong to more than one apperception mass, so that there are many paths of association along which we may travel when we are rummaging in our minds for a forgotten fact.

472. When you recall any event of your past life which 'made an impression' on you, as we say—and you see how literally true the saying is—you will find that in your mental picture there is very much more than the object of central interest. We cannot revive that without reviving the other things—sights and sounds—that made up the original picture. Hardly noticed at the time, perhaps, they yet left their traces, and they come up unsought. It is indeed to those associated ideas that we owe the feeling of familiarity, the 'mood of at-homeness,' of which psychologists speak. More curious still, you feel *yourself* there as part of that original picture. Part of the mood

of at-homeness is the conviction that 'I was there.'

473. Sometimes, when we are in a contemplative mood, memories of past events come floating into our consciousness from nowhere. Something, we know not what, starts a train of images, one leading to another because they are in some way associated (298). This is known as Spontaneous Memory. At other times we have trouble in recalling a fact that we very much want. Instinctively, then, we work by the law of association. We all do it. We *think back*, and try every kind of reminder. Have you forgotten a friend's address? You probably begin by running through the alphabet, but with the alphabet you use every other thread of association you can think of. When you thus make efforts to remember, bringing your will to bear upon the operation, it is called Volitional Memory. But the term is scarcely more than a term, for we cannot by willing recall anything. All that the will can do is to set certain trains in motion and then to lie in wait while Spontaneous Memory presents for acceptance or rejection items from our store of associated ideas.

474. Psychologists who divide Memory into Spontaneous and Volitional also distinguish between 'remembering' and 'recollecting.' Remembering is spontaneous, recollecting is hunting up clues. The difference is very slight; for whether the fact comes into consciousness of itself, or we have to worry back to find it, the result is the same. Memory, spontaneous or volitional, is just memory.

475. We all recognize that some people have better memories than others. If memory is conditioned by brain paths we can understand how this happens. Some brains take impressions better, and keep them better, than others. In Professor James's words, 'Some minds are like wax under a seal—no impression is wiped out. Others, like a jelly, vibrate to any touch, but under usual conditions retain no permanent mark.' Now the interesting thing about this, and an important fact to remember, is that the brain we are born with is the brain with which we have to work to the end of our days, and we are told that we can do nothing to improve its original quality as to power of retention. We can keep it healthy by keeping ourselves healthy, but that is all.

476. This sounds discouraging. What is poor Jelly-brain to do? Is he to be for ever handicapped in life's race because nature has given him an unimpressionable cortex?

477. Not necessarily. It sometimes happens that a person who has a bad memory, and is aware of that fact, will in the long run prove more efficient than he who trusts to his good memory to pull him through all difficulties. The memory, as we have seen, works by association, and though it is possible that the brain cannot be improved as to its original retentiveness, the memory can be trained to work in any particular direction by multiplying the paths of association *in* that direction. In every branch of knowledge facts can be organized into a reliable system, within which memory will work satisfactorily.

478. Now, this is a matter in which the teacher has great responsibility. The grown-up student can, perhaps, learn to organize his studies for himself, but the child cannot; it has to be done for him. He has to be taught *in such a way* that every fact will be held fast by association with every other fact within a given system. He has, in short, to be taught to think, for it is thinking that does it. We learnt long ago that thinking means seeing relations, and seeing relations establishes associations; so that—

'Of two men with the same outward experiences, the one who thinks over his experiences most, and weaves them into the most systematic relations with each other, will be the one with the best memory.'—*James*.

479. This must not be understood to mean that a good memory is to be under-valued. It is a most precious possession; and the person so endowed may, if he uses it in the right way, rise to heights of efficiency unscaleable by his brother of the less retentive brain. The danger is in trusting to memory alone. Many do this when, after an idle term, they face an examination. We call it cramming. It is often quite successful as far as the examination goes (though much depends on the acuteness of the examiner); but knowledge acquired in this hurried fashion does not stick. It has not time to form sufficiently numerous or strong associations.

480. Cramming has its uses. The barrister has to train himself to it. He gets up the details of an intricate case in a few days; he forgets them in a few hours, when the case is over. He crams with

the intention of forgetting. But knowledge that we want to keep has to be acquired gradually, thought over, welded together step by step as we progress.

481. Forming associations is a process which the mind does for itself. What we have to do—what the teacher has to do—is to provide the conditions under which such memory processes shall take place.

482. What have we learnt, so far, that may help the teacher to provide those conditions?

(*a*) We know that the stronger the impression the greater the chance of revival (141). The effectiveness of our presentation will affect the memory of it.

(*b*) We know that to recall a past experience a reminder or cue is needed (186). What is to be remembered must be labelled.

(*c*) We know that ideas which are presented together have a tendency to reappear together (345). Ideas thus associated will serve as cues to recall one another.

(*d*) We know that familiarity helps recall (156). Repetition and drill promote familiarity.

(*e*) We know that a formula helps the memory (332). Formulas are good, provided they are a summing up of a thinking process.

(*f*) We know that attention deepens impressions (141), and that effective attention in learning is secured by interest (426). Attention, interest, and feeling, will all react on memory.

These, and the like, are conditions under which the mind will spin its own threads of association.

483. The pianist's memory is a special brand, a sort of amalgam. I have already spoken of the sense-memories and the part they play in it—eye and ear and touch. (At this point re-read Chapter V, pars. 174 to 178.) But to one important element I only alluded there, viz. to the analytical memory, the memory of the intelligence. By analysis we get a firmer grip of the composer's thought than the ear alone can give us. The thought itself becomes more definite. We note his treatment of it at each re-statement, the little differences which sometimes upset the less reliable memories of eye and ear and touch. Teachers all know how a pupil's memory is thrown out sometimes by the likenesses and differences in first and second endings, for example. As we think over a composition, the threads of association multiply and hold it together. We see it as a connected whole, as we think of a poem as a whole.

484. And here the question may suggest itself: Is it better to memorize a piece of music by repeating it straight through many times, or by practising it in short sections? It has been proved, I believe, that it is easier to learn a poem as a whole, i.e. by reading it through many times, than to memorize a stanza at a time (yet the latter is the usual way in which children are told to learn poetry). On the straight-through plan the whole argument of the poem is brought before us, with its details in their order; so that while we are memorizing the poet's words we are also memorizing his thoughts with all their connecting links. On the verse-by-verse plan we set up a connection

between the last line of a verse and its own first line (by the act of repetition) instead of with the first line of the following verse. While the verbal memory is at work on short sections the sequence of thought is likely to be missed; and when all the verses have been memorized in this way the learner has sometimes a difficulty in remembering 'what comes next.'

485. Does anything of this apply to the memorizing of instrumental music? I do not think the experiment has been tried. If a teacher with a large number of pupils at different stages would try it, we might get some interesting results. The principle of association applies, of course, to music as to literature. The sequence of ideas must be followed. But in memorizing a piece of prose or poetry we use our mother tongue, the thoughts are clothed in the words we use every day, and we have no trouble in reproducing them; and I have no doubt that in vocal music the totalwise plan would be best, the mechanism offering no difficulty. But the player, however well he may know the written language of music, always has the mechanism of his instrument to reckon with. The composer's plan may be easy to grasp, but the mechanism required in its reproduction may be difficult here and there, interfering with the straight-through method of memorizing. So that we must not jump to the conclusion that what applies to literature, whether in learning it or in listening to it, applies altogether to music. The poet's thought is (usually) clear; the musician's thought is always veiled.

486. 'Music is a funny thing,' said a little boy, when a relative had been playing to him; 'it seems to *say things* to you.' To which his brother added, 'Yes, and the queer thing about it is that *you never can tell exactly what it says*.' The children between them put the matter in a nutshell. The language of music is spiritual. It comes and it goes, and in its flight it drops a message which each soul that hears may interpret in a different way. Music does indeed say things to us. Noble things, ignoble things, merry things and sad; heroic, grand things; tender things; sometimes silly and inane things. And though we 'never can tell exactly what it says,' it influences us in some subtle way—helps to make us better or worse (there is no doubt of that); makes us happy or uncomfortable.

487. The question whether, in memorizing instrumental music, the totalwise plan or the instalment plan is best, cannot be pronounced upon until a sufficient number of experiments have been tried on pupils of different ages and of different mentality. It is worth attention and experiment because of the importance of economy of time in teaching.

488. The main fact for teachers to remember is that as habit depends on repetition, so memory depends on association.

489. If remembering is necessary to our mental wellbeing, so also is forgetting. If we remembered all things equally well, our minds would be clogged with unnecessary details; we could not think at all. Fortunately the mind has a way of dropping

threads of association when they have done their work. In learning, we may have to go through a process many times, with a certain amount of detail. Then the process becomes more rapid, we find short-cuts, and by and by we forget the process by which we learnt altogether; we simply *know*, and take the knowledge as a matter of course.

490. The teacher, by her method of working, can promote not only organized remembering but judicious forgetting. She builds up, and then gradually removes the scaffolding. Scaffolding is necessary in building, but when the structure is complete it obstructs the view. 'A good memory forgets well.' It retains the essentials, drops the unessentials.